International Journal of Research in Advent Technology, Special Issue, NCRCEST 2019
E-ISSN: 2321-9637
Available online at www.ijrat.org

Smart and Sophisticated Artificial Railway Crossing Platform Using IoT

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Abstract: The main aim of our project is to construct a movable artificial railway platform above the tracks with same platform height.it will help the passengers to easily move from one platform to another to reach destination. Proposed system is also capable of recognizing train arrival and departure and there by intelligent controlling the movable platform. Our system sends alerts through Wi-Fi module to passenger mobile phone when the platform gets operated. The main part of the system is a microcontroller. IR sensors, DC motors, PIR sensors, limit switches and buzzer are interfaced to the microcontroller. When there is no train on the tracks, the microcontroller will move the dc motors to which movable platform setup is connected. The system sends alerts through Wi-Fi module to passenger mobile phone when the platform gets operated. So, artificial platform is made between two platforms for the passengers to move on. When there is train arrival, the microcontroller alerts through buzzer and clears off the movable platform so that train passes.

Keywords: artificial railway platform, PIC microcontroller, Wi-Fi module, IR sensors, DC motors, PIR sensors, limit switches, buzzer

1. INTRODUCTION

At present Indian Railway is the largest railway network in the south Asia. It manages the fourth-largest railway network in the world by size, with
Coverage area of 121,407 Km (Kilometre).our Indian railways runs over 20,000 trains from 7349
Stations across India. A definitive Purpose of our project prototype is to boost the Indian railway platforms to assist the physically challenged, aged persons and individuals to cross the intersection platforms. Moving a physically challenged individuals beginning with one platform then onto successive platform is difficult by utilizing Staircase and escalators Movable plate's square measures connects both the platforms of the same
Height. At the purpose once there is no arrival of the train to the station the artificial movable platforms are going to be opened and consequently moving opposite to each other. The physically challenged people can utilize the moving platform to pass the platforms from one end to another end. At that situation once the train is approaching a station the moving platforms is going to be shut. With the prior information to the passengers through buzzer and the Application to the user. So that if any humans are present then PIR sensor is going to detect and intimate to the concern member. The projected frame work provides a superior account of crossing of physically challenged people in one platform to a different platform while not utilizing the stairs and escalators. Our proposed framework gives an answers for exchanging physically handicapped people from one Platform to another Platform without utilizing fly overs, stair case and lifts. The mobile plates between two Platforms associate the Platforms and the lift consequently moves.

2. LITERATURE SURVEY

In the current existing method railway platforms are not well designed and developed. As of now some stations does not have platform of certain height. Presently we are using staircase or escalator to move from one platform to other platform. It is difficult and hard for physically challenged and disabled people to use the stairs from one platform to other platform.as we know that the platforms for train departure or halt is not same all the time. Its keep on changing. Mainly in the junctions stations there are more number of platform then it becomes more difficult to cross the platform from one to another. Sometimes people crosses the railway track directly without using stairs or escalator because of lack of time or to catch the running train. It is risky for their lives. Many time people will be moving from one platform to another through the trains present on opposite side which may be life threat.

3. PROPOSED SYSTEM

As we know that our Indian railway system sometimes don't follow the timing due to some issues. In proposed system the status of every train is known using IR Sensors and informs it to micro controller. The latest survey from the social analytics was said that the most negative aspects in Indian railway is climbing up the overhead steps for the physically challenged people. Our proposed system particularly rectifies or solve the difficulty by introducing the brand new concept of using Wi-Fi module system. Now a days each of us use the smart phones it is easy to connect to network and see which platform is opened rather than going to display board. Connecting to the network we can notify the passenger that which platform is opened and which platform is closed. We have used the default application to notify the opening and closing of platforms. In real time we can built the applications for the multiple platforms so that every passenger can be able to know on which platform is opened and closed. So that he can take alternative steps to reach the destination platform for the success approach sensors are used and for the execution

we are using and for the controlling operations with the help of micro controller. The proximity sensor senses the train as it approaches the station and provides relevant information to controller for further action micro controller. The PIR sensor detects the moving people and warn them using the buzzer or light after intimating the passenger regarding the arrival of train the platform is disconnects during the advent of the educate. After the train has arrived another time synthetic platform may be created up to teach on any other side. After the train has arrived from the platform the artificial bridge again closes and informs the passenger to use the alternative method like lift or escalator. After the train has departed artificial platform is formed again and notify the passenger to use the artificial platform.

4. THE MAIN BLOCKS OF PROJECT

Regulated Power Supply, Microcontroller, Limit switches, IR sensors, PIR sensor, LDR sensor, Relay with driver, Buzzer with driver, DC motor with driver, LED Indicators, Crystal Oscillator ,Reset, Load, Wi-Fi module.

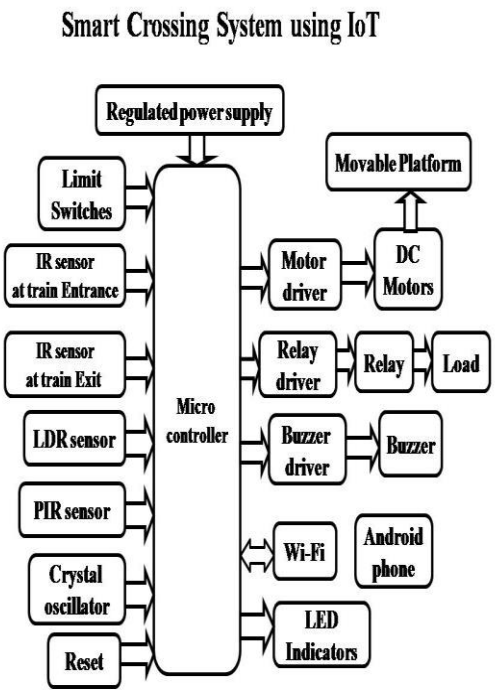

Fig:4.1 Block diagram

5. MICRO CONTROLLER:

Microprocessors and microcontrollers are the devices used in embedded systems products. Micro controller is a programmable device. A microcontroller has a CPU in additional feature to a fix amount of RAM, ROM, I/O ports and embedded on a single microchip. The fixed pins of on-chip ROM, RAM and number of I/O ports in microcontroller makes them ideal for many applications in which cost and space are crucial.

Fig 5.1: Microcontroller

The microcontroller used in this project is PIC16F877A.The PIC family of microcontrollers are initially developed by Microchip Technology. At present they are the most popular microcontrollers, selling over 120 million devices each year. PIC can be defined as Peripheral Interface Controller said by Microchip Technology to identify its single-chip microcontrollers. These microcontroller devices have been very success full in 8-bit microcontroller.

6. REGULATED POWER SUPPLY:

Power supply is a supply of electrical power. A device or system that supplies electrical or other types of energy to an output load or group of loads is called a power supply unit or PSU. The term is mostly applied to electrical energy supplies. A power supply also includes power distribution system as well as primary or secondary sources of energy such as Conversion of one form of electrical power to another required form and voltage, its involving in converting AC voltage to a well-regulated lower-voltage DC for electronic devices. Low voltage. Generally, low power DC power supply units are commonly integrated with the devices they supply, such as computer and households electronics devices.

- Batteries.
- Chemical fuel cell and also other forms of energy storage system.
- Solar power.
- Generators or alternators

- **Block Diagram:**

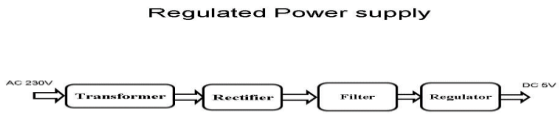

Fig 6.1:Block diagram of Regulated power supply

7. TRANSFORMERS:

A transformer is a device that transfers electrical energy from one circuit to another through inductively coupled conductors without changing its frequency. A varying current in the first or primary winding creates a varying magnetic flux in the transformer's core, and thus a varying magnetic field through the secondary winding. This varying magnetic field induces a varying electromotive force (EMF) or "voltage" in the secondary winding. This effect is called mutual induction.

8. IR SENSOR

Fig 8.1: IR Sensor

This sensor is a type of sensor which detects short range obstacles with no dead zone. It has a majorly narrow detection area which can be increased by the dual version. Its Range can also be increased by increasing the power to the IR LEDs sensors or adding more IR LEDs Sensors so that its gong to detect the train arrival and departure.

9. D.C. MOTOR:

A DC motor can produce mechanical energy by using electric energy, it's very typically through the interaction of magnetic fields and current carrying conductors. It usually converts electrical form of energy from mechanical energy and it can be accomplished by alternator generator. Many types of electric motors can be run as forward, and vice versa. The main input of a DC motor is current or voltage and its output is in the form of torque.

Fig 9.1: DC Motor

10. LIMIT SWITCH

Limit Switch are basic type switches which protect them from external forces like water, oil, and dirt from environment Many models are there such as those resistant to head, cold, or corrosion, as well as high-precision models

Fig 10.1: Limit Switch

11. BUZZER

Basically, the main source of a piezoelectric sound component is a piezoelectric diaphragm. A piezoelectric consists of a piezoelectric plates which has electrodes on both the sides and a metallic plate. It is used to intimate the passenger that train is arriving or departure. The Buzzer is like warning to the passenger that platform is going to close or open when AC voltage is applied across electrodes producing sound waves in the air.

Fig 11.1: Buzzer

12. WI-FI MODULE

Wi-Fi is commonly known as the fast becoming the preferred mode of connecting to the internet. Many people do not aware of the description and explanations related to conceptt. Wi-Fi gets its name from a certification called Wireless Fidelity given to networks operating under 802.11 standards. Wi-Fi allows computers, PDAs and other devices to connect to a broadband connection in a wireless mode. The standard 802.11 defines wireless communication operating system via electromagnetic waves. While examining the descriptions and explanations related to Wi-Fi, one should remember that there are different modes are available for wireless networks like Infrastructure mode and Ad-Hoc mode this can be used for different criteria. Wi-Fi is a kind of mechanism for wireless connecting electronic devices. A device enabled with Wi-Fi, such as a personal computer, video game console, smart phone, or digital audio player, can connect to the Internet via a wireless network access point. An access point has a range of about 20 meters (65 ft) indoors and a greater range outdoors. Multiple overlapping access points can cover large areas.

Fig 12.1: Wi-Fi module

13. PIR SENSOR

The PIR Sensor is used to detect the moving motion up to 20 feet away by using a Fresnel lens and infrared sensitive element it is used to detect changing patterns of passive infrared emitted by objects. It is Inexpensive and easy to use .The PIR Sensors is compatible with all Parallax micro controllers. It always used to detect whether a human has moved in wards or out wards of the

sensors range. This sensors are small in size, inexpensive, low-power usage, easy to use and mainly it don't wear out. For that reason they are commonly found in home appliances and gadgets used in businesses.

Fig 13.1: PIR Sensor

14. SCREENSHOTS

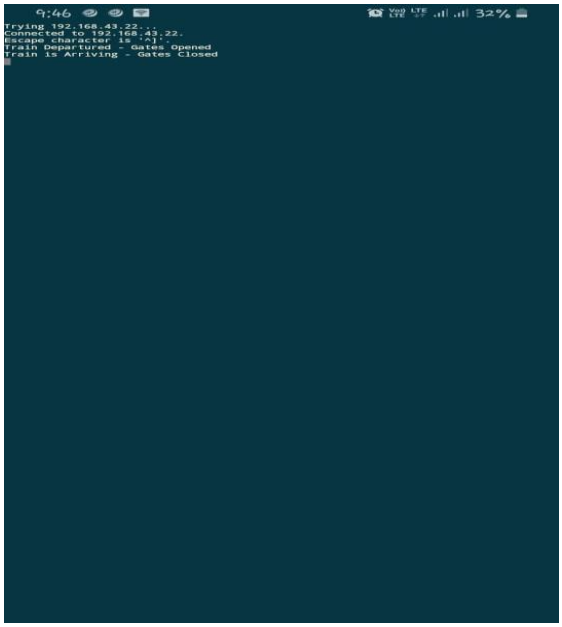

Fig14.1: Mobile Application

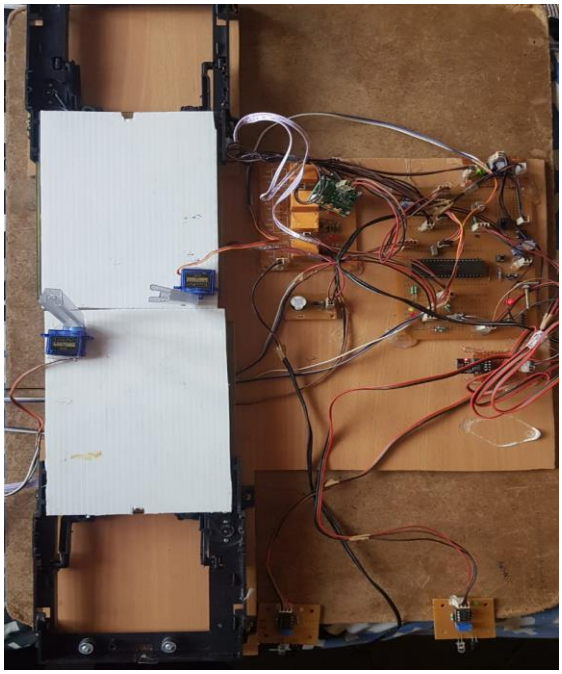

Fig 14.2: artificial platforms closed

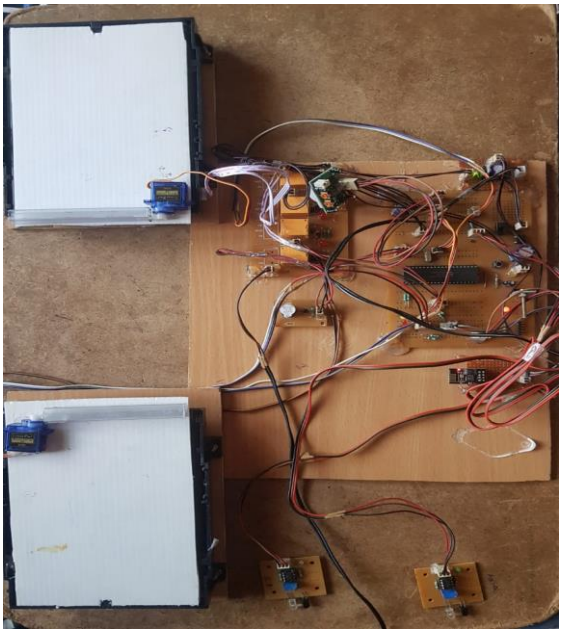

Fig14.3: Artificial platforms open

15. RESULTS:

The project "**Smart and Sophisticated artificial Railway crossing platform system using IOT**" was to construct a movable railway platform above the tracks with same platform height.it will help passengers to move from one platform to another platform and reach the destination platform. This proposed system is used to identifying train arrival and departure and there by intelligent controlling the movable platform. When the train is arriving prior information is given to the passengers to vacate the platform. the system also uses PIR sensor and LDR sensor for presence of human being detection, day or night light detection and controls the devices like lights and fans. The system sends alerts through Wi-Fi module to passenger mobile phone when the platform gets operated. After the train gets departure the movable platform comes closure that the passenger can use it.

16. CONCLUSION:

Mainly the whole project aims towards trying to avoid accidents and reduce the number of fatalities in the field of railway transportation system. By this project we can built artificial platform which saves the time and the complexities for moving from one platform to another and by the prototype which we had developed can make easily known on which platform the artificial platforms are opened and closed so that they can easily pass through it. Secondly, using of highly advanced IC's and sensors took necessary steps to avoid the accidents and it is more helpful for the aged people to reach the destination platform.

FUTURE SCOPE:

Our project "**Smart and Sophisticated artificial Railway crossing platform system using IOT**" is mainly intended to construct a movable railway platform above the tracks with same platform height.it will help passengers to easily move from one platform to another platform and reach the destination platform This

proposed system is capable of identify train arrival and departure and there by intelligent controlling the movable platform. The system also uses PIR sensor and LDR sensor for presence of human being detection, day or night light detection and controls the devices like lights and fans. The system sends alerts through Wi-Fi module to passenger mobile phone when the platform gets operated. This project can be extended using GSM modem for status feedback when the platform performs operation and Ultrasonic sensors which give better performance than IR sensors used in the project.

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